

REMARKS

In the Office Action dated May 5, 2006, the Examiner objected to claim 19 for insufficient antecedent basis, and rejected claims 18-26 under 35 USC § 103(a) as being unpatentable over Luukkala (4,906,107) in view of Kim et al. (4,516,864). Additional references were cited on form PTO-892 by the Examiner but not relied upon. In response to these rejections, applicants have amended some of the claims, added new claims 27-29, but no new matter has been added.

Antecedent Basis

The Examiner objected to claim 19 for lack of antecedent basis. Applicant has amended claim 19 to provide antecedent basis for the claim limitation "liquid." Therefore, application respectfully requests that this objection be withdrawn.

35 USC 103(a)

The Examiner rejected claim 18, under 35 USC § 103(a), as being unpatentable over Luukkala in view of Kim et al. This rejection is respectfully traversed. Claims 19-26 depend from claim 18.

The Luukkala reference discloses a temperature sensor having an optic fiber entering a measuring cell that contains water, paraffins, waxes, oils or fats. In solid form, the substance in the measuring cell scatters the light. The scattered light is detected by a second optic fiber connected to the measuring cell resulting in a signal in the second fiber that is detected by a detector. When the measuring cell reaches a temperature at which the substance contained therein melts or changes phase to become transparent, the light entering the measuring cell via the first fiber is no longer scattered, causing the signal to diminish or disappear, indicating the temperature of the measuring cell. Two additional embodiments show a single fiber into the cell with light entering and leaving via the same fiber, and an in-line embodiment with light entering one end of the cell and leaving the other end.

Claim 18, as amended, provides a temperature sensor that uses fiber optics connected to a cell that contains a chemical that changes phase at a predetermined temperature. The transparency of the material after the phase change results in a

signal to indicate the temperature. The signal differs from Luukkula by using a mirror to reflect the light that is transmitted into the cell holding the chemical, and detecting the reflected light from the mirror depending on the phase state of the chemical.

The Kim reference discloses sensing the melting of a flowing mass of a polymer or melt by transmitting light through the flow of polymer. The light is transmitted through windows placed on opposite sides of the flow. Light is also reflected against the surface of the flow, the reflectivity of which is determined by the interface reflectivity of the melt. Thus, the Kim reference shows that reflected light is detected, but not reflected light that has been transmitted through a phase-changing chemical, nor light that is reflected by a mirror, as claimed in amended claim 18.

To further distinguish over Kim et al., Applicant has added new claims 27-29.

Moreover, the Luukkula reference teaches in the preferred embodiment that the scattering of the light results in the detected signal, whereas the transparent phase of the chemical results in no signal – the opposite of the claimed invention.

Therefore, Applicant respectfully asserts that Claim 18, as amended, is non-obvious over the Luukkula reference in light of Kim et al. Kim et al. fails to teach or suggest any of the differences between the claimed invention and the Luukkula reference. Moreover, Luukkula fails to teach any of the claim limitations added by new claims 27-29. Thus, when combined, the Luukkula reference in light of Kim et al. would not suggest the claimed invention to one of ordinary skill in the art.

Claims 19-29 are also believed to be allowable in view of their dependence from Claims 18.

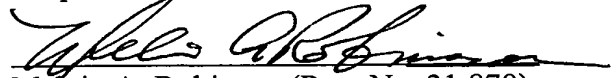
Additional Art

The additional art cited by the Examiner but not relied upon is noted by the Applicant.

Conclusion

In view of the remarks set forth above, Applicant respectfully submits that the present invention is in condition for allowance.

Respectfully submitted,



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